

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1. (currently amended) A process for amplifying a reaction between a ligand and a receptor of a ligand-receptor pair comprising:

a.) producing or acquiring, from said ligand and/or receptor signals produced from an electromagnetic signal picked up from a biologically active element such as said ligand and/or receptor, ~~that are characteristic of the biological or chemical activity or the biological or chemical behavior of said ligand and/or receptor~~ said signals being produced or acquired according to a method comprising:

i.) placing said biologically active element such as said ligand and/or receptor in a zone subjected to an excitation field of an electrical, magnetic or electromagnetic type, wherein said excitation field is produced by an excitation signal having a frequency between about 20 Hz and about 20,000 Hz; and

ii.) converting the fields resulting from the interactions of said excitation field and said ligand and/or receptor into signals by means of a first transducer or acquisition sensor receiving said resulting fields, ~~wherein said signals are characteristic of the biological or chemical activity or behavior of said ligand and/or receptor~~

b.) bringing said ligand and said receptor of said ligand-receptor pair into contact in conditions suitable to allow their reaction; and

c.) applying produced electromagnetic signals transduced from said signals ~~said electromagnetic signal characteristic of the biological activity of at least one of said ligand or said receptor~~ to at least one of said ligand or receptor, wherein said produced electromagnetic signals can be applied prior to, simultaneous with, or subsequent to said ligand and said receptor being brought into contact,

wherein said process amplifies the reaction at least in part by increasing the binding affinity properties of at least one of said two elements.

2. (previously presented) The amplification process according to claim 1, wherein the reaction between said ligand and said receptor is achieved by bringing two reagents, containing respectively said ligand and said receptor, into contact, and applying said at least one electromagnetic signal to at least one of said reagents.

3. (previously presented) The amplification process according to claim 2, wherein applying said at least one electromagnetic signal to said at least one reagent is achieved by exposing a solution or a suspension comprising said at least one reagent to said at least one electromagnetic signal.

4. (previously presented) The amplification process according to claim 2, wherein said application of said at least one electromagnetic signal, to said at least one reagent is achieved by diluting a solution or a suspension comprising said at least one reagent in a solvent already exposed to said at least one electromagnetic signal.

5. (previously presented) The amplification process according to claim 2, wherein said application of said at least one electromagnetic signal, to said at least one reagent is achieved by dissolving or putting into suspension said at least one reagent in a solvent already exposed to said at least one electromagnetic signal.

6. (previously presented) The amplification process according to claim 4, wherein said solvent already exposed to said at least one electromagnetic signal comprises water physiological solute, or combinations thereof.

7. (previously presented) The amplification process according to claim 2, wherein said at least one electromagnetic signal comprises the electromagnetic signal picked up from an analytical sample suspected to contain said at least one ligand or receptor.

8. (previously presented) The amplification process according to claim 2, wherein said at least one electromagnetic signal comprises the electromagnetic signal radiated by an electromagnetic radiation source.

9. (previously presented) The amplification process according to claim 1, wherein said reaction between said ligand and said receptor is achieved by bringing an analytical sample suspected to contain said at least one ligand or receptor into contact with a reagent containing either said receptor or said ligand, and applying said at least one electromagnetic signal to said sample and said reagent.

10. (previously presented) The amplification process according to claim 9, wherein said application of said at least one electromagnetic signal to said analytical sample is achieved by exposing said sample to said at least one electromagnetic signal or by diluting said sample in a solvent already exposed to said at least one electromagnetic signal.

11. (previously presented) The amplification process according to claim 9, wherein said application of said at least one electromagnetic signal to said reagent is achieved by exposing a solution or a suspension containing said reagent to said at least one electromagnetic signal, by diluting a solution or suspension in a solvent already exposed to said at least one electromagnetic signal, or by dissolving or putting into suspension said reagent in a solvent already exposed to said at least one electromagnetic signal.

12. (previously presented) The amplification process according to claim 9, wherein said at least one electromagnetic signal is applied to said analytical sample and said reagent by exposing a solution or a suspension containing said sample and said reagent to said at least one electromagnetic signal or by diluting said solution or suspension in a solvent already exposed to said at least one electromagnetic signal.

13. (previously presented) The amplification process according to claim 9, wherein said at least one electromagnetic signal is applied to said analytical sample, and said reagent at the same time.

14. (previously presented) The amplification process according to claim 10, wherein said solvent having been previously exposed to said at least one electromagnetic signal comprises water, physiological solute, or a combination thereof.

15. (previously presented) The amplification process according to claim 1, further comprising acquiring said at least one electromagnetic signal.

16. (previously presented) The amplification process according to claim 15, wherein said acquiring comprises recording and retrieving data, wherein said data represents said at least one electromagnetic signal.

17. (previously presented) The amplification process according to claim 1, further comprising detecting, measuring, or a combination thereof, the complexes resulting from the reaction between said ligand and said receptor.

18. (previously presented) The amplification process according to claim 9, wherein said ligand is an antigen or a hapten and said receptor is an antibody or a membranous receptor directed specifically against said ligand.

19. (previously presented) The amplification process according to claim 18, wherein said reaction between said ligand and said receptor is revealed by agglutination.

20. (previously presented) A process for detecting the presence of a substance corresponding to said ligand or said receptor in an analytical sample, comprising a process according to claim 1.

21. (previously presented) A detection process according to claim 20 comprising:
bringing at least two reagents, containing respectively, said ligand and said receptor into contact, in conditions suitable to allow their reaction;
applying at least one electromagnetic signal characteristic of the biological activity of the analytical sample to at least one of said ligand or receptor, wherein said signal is an electromagnetic signal.

electromagnetic signal can be applied prior to, simultaneous with, or subsequent to said ligand and said receptor being brought into contact; and

detecting, measuring, or a combination thereof at least one ligand-receptor complex formed during the reaction between said ligand and said receptor.

22. (previously presented) A detection process according to claim 21, wherein the concentrations of said ligand and said receptor are chosen so as to be sufficient to obtain ligand-receptor complexes detectable in the absence of the application of said at least one electromagnetic signal, but lower than the concentrations likely to lead to a saturation of the reaction between said ligand and said receptor.

23. (previously presented) A detection process according to claim 20, comprising:
bringing said analytical sample into contact with a reagent comprising either the receptor, if the substance sought in the sample is the ligand, or the ligand, if the substance sought in the sample is the receptor, in conditions suitable to allow their reaction;

applying said at least one electromagnetic signal to said sample, said reagent, or both said sample and said reagent; and

detecting, measuring, or a combination thereof any ligand-receptor complexes that may have been formed.

24. (withdrawn) A device for detecting the presence of a substance corresponding to one of the two elements of a ligand-receptor pair in an analytical sample, characterised in that it implements a process according to claim 20 and in that it comprises:

a) reception means (47) of the analytical sample and of a reagent containing either the receptor, or the ligand, allowing them to be brought into contact in conditions suitable to allow their reaction;

b) an electromagnetic signal source (5, 9, 9', 19) characteristic of the activity of the ligand and/or the receptor;

c) application means (51) of the signal delivered by said electromagnetic signal source (5, 9, 9', 19) to the sample and/or the reagent; and

d) detection and/or measurement means (53, 55, 57) of the ligand-receptor complexes formed during the reaction between said ligand and said receptor.

25. (withdrawn) A device for detecting the presence of a substance corresponding to one of the two elements of a ligand-receptor pair in an analytical sample, characterised in that it implements a process according to claim 20 and in that it comprises:

- a) reception means (47) of two reagents containing respectively the ligand and the receptor, allowing them to be brought into contact in conditions suitable to allow their reaction;
- b) means for acquiring an electromagnetic signal from the analytical sample;
- c) means (51) for applying the signal delivered by said electronic signal acquisition means (5, 9, 9', 19) to one and/or the other of the reagents; and
- d) means (53, 55, 57) for detecting and/or measuring the ligand-receptor complexes formed during the reaction between the two reagents.

26. (withdrawn) A device according to claim 24, characterised in that the detection means comprise optical detection means.

27. (withdrawn) A device according to claim 24, characterised in that it includes an enclosure (13) fitted with an electrical and magnetic shielding surrounding said reception means (47).

28. (previously presented) The process of claim 20, wherein said process is used in biological diagnostics in human or veterinary medicine.

29. (previously presented) The process of claim 20, wherein said process is used for bacteriological control in the pharmaceutical industry, the cosmetic industry, or the food production industry.

30. (previously presented) A process for detecting the presence of an electromagnetic test signal characteristic of the biological activity of a substance corresponding to a ligand or a receptor of a ligand-receptor pair, in an electromagnetic test signal, comprising the implementation of an amplification process according to claim 1.

31. (previously presented) A detection process according to claim 30, wherein said electromagnetic signal is the electromagnetic signal radiated by an electromagnetic radiation

32. Cancelled

33. (currently amended) A process according to claim 32 1, wherein said excitation signal has a uniform spectral power, of the white noise type.

34. (currently amended) A process according to claim 32 1, wherein said zone subjected to said excitation field is isolated from fields coming from the environment.

35. (currently amended) A process according to claim 32 1, further comprising:
applying said signals coming from said first transducer, by means of a second transducer, to a biological receptor system,

wherein said signal is applied in such a way that the biological or chemical activity or behavior of the biological receptor system will be modified in accordance with the nature of the biological or chemical activity or behavior of said substance.

36. (withdrawn) A system for producing or acquiring signals, particularly electrical signals, characteristic of the biological and/or chemical activity or of the biological and/or chemical behaviour of a substance (1) or of an active element contained in said substance and a system for implementing the properties of such signals;
said system including:

- an emitter (15, 17) generating an excitation field of an electrical, magnetic and/or electromagnetic type in a zone (13) where said substance is located; said emitter being excited by an excitation signal having particularly a frequency between 20 Hz and 20 000 Hz;

- a first transducer or acquisition sensor (5) receiving fields resulting from the interaction of said excitation field and said substance, said first transducer converting said resulting fields into signals, particularly electrical signals,

(said signals are characteristic of the biological and/or chemical activity or of the biological and/or chemical behaviour of said substance or said active element contained in said substance).

- a second transducer (6) converting said signals into signals suitable for being transmitted to a biological receptor system.

(in such a way that the biological and/or chemical activity or the biological and/or chemical behaviour of the biological receptor system will be modified in accordance with the nature of the biological and/or chemical activity or the biological and/or chemical behaviour of said substance).

37. (withdrawn) A system according to claim 36, the characteristic of said excitation signal being that it has a uniform spectral power.

38. (withdrawn) A system according to any one of the claims 36, such that it further comprises:

- shielding means (13) to isolate said zone from the parasitic fields coming from the environment.

39. (withdrawn) A device for producing or acquiring signals, particularly electrical signals, characteristic of the biological and/or chemical activity or of the biological and/or chemical behaviour of a substance or of an active element contained in said substance; said device including:

- an emitter (15, 17) generating an excitation field of an electrical, magnetic and/or electromagnetic type in a zone (13) where said substance is located; said emitter being excited by an excitation signal having particularly a frequency between 20 Hz and 20 000 Hz;

- a first transducer or acquisition sensor (5) receiving fields resulting from the interaction of said excitation field and said substance, said first transducer converting said resulting fields into signals, particularly electrical signals,

(said signals are characteristic of the biological and/or chemical activity or of the biological and/or chemical behaviour of said substance or said active element contained in said substance).

40. (withdrawn) A device according to claim 39, the characteristic of said excitation signal being that it has a uniform spectral power.

41. (withdrawn) A device according to claim 39, such that it further comprises:

- shielding means (13) to isolate said zone from the parasitic fields coming from the environment.

42. (previously presented) An process for amplifying a reaction between a ligand and a receptor of a ligand-receptor pair, comprising:

bringing said ligand and said receptor of said ligand-receptor pair into contact in conditions suitable to allow their reaction; and

applying an electromagnetic signal, obtained from an electrical signal produced by a sensor placed in front of at least one of said ligand or said receptor of the ligand-receptor pair.

43. (previously presented) The process according to claim 42, wherein said reaction between said ligand and said receptor is obtained by bringing at least two reagents, containing respectively, said ligand and said receptor, into contact and applying an electromagnetic test signal suspected to include the electromagnetic signal characteristic of the biological activity of at least one of said ligand or receptor of said ligand-receptor pair to at least one of said two reagents.

44. (previously presented) The process according to claim 43, wherein said application of said electromagnetic test signal is accomplished by exposure of a solution or a suspension containing said at least one reagent to said electromagnetic test signal.

45. (previously presented) The process according to claim 43, wherein said application of said electromagnetic test signal is accomplished by dilution of a solution or a suspension comprising at least one of said reagents, in a solvent already exposed to said electromagnetic test signal.

46. (previously presented) The process according to claim 43, wherein said application of said electromagnetic test signal is accomplished by dissolution or putting into suspension at least one of said reagents in a solvent already exposed to said electromagnetic signal.

47. (previously presented) The process according to claim 45, wherein said solvent comprises water, physiological solute, or a combination thereof.

48. (previously presented) The process according to claim 43, wherein said electromagnetic test signal is the electromagnetic signal obtained from an electrical signal produced by a sensor placed in front of an analysis sample suspected to contain said ligand or said receptor.

49. (previously presented) The process according to claim 43, wherein said electromagnetic test signal is the electromagnetic signal radiated by an electromagnetic radiation source.

50. (previously presented) The process according to claim 42, wherein an analysis sample suspected to contain said ligand or said receptor is brought into contact with a reagent containing either said receptor, or said ligand, and said electromagnetic signal characteristic of the biological activity of at least one of said ligand or receptor is applied to said sample reagent combination.

51. (previously presented) The process according to claim 50, wherein said electromagnetic signal is applied by exposing said sample to said electromagnetic signal, or by dilution of said sample in a solvent already exposed to said electromagnetic signal.

52. (previously presented) The process according to claim 50, wherein said electromagnetic signal is applied by exposing a solution or a suspension containing said reagent to said electromagnetic signal, by dilution of said solution or suspension in a solvent already exposed to said electromagnetic signal or signals, or by dissolution or putting into suspension of said reagent in a solvent already exposed to said electromagnetic signal.

53. (previously presented) The process according to claim 50, wherein said electromagnetic signal is applied by exposure of a solution or a suspension containing said sample and said reagent to said electromagnetic signal, or by dilution of said solution or suspension in a solvent already exposed to said electromagnetic signal.

54. (previously presented) The process according to claim 50, wherein both said electromagnetic signal characteristic of the biological activity of the ligand and said electromagnetic signal characteristic of the biological activity of the receptor are applied thereto.

55. (previously presented) The process according to claim 51, wherein said solvent is water, physiological solute, or combinations thereof.

56. (previously presented) The process according to claim 42, further comprising acquiring said electromagnetic signal characteristic of the biological activity of said ligand or said receptor of said ligand-receptor pair.

57. (previously presented) The process according to claim 56, wherein said acquiring said electromagnetic signal comprises recording and restitution of information, wherein said information is representative of said electromagnetic signal characteristic of the biological activity of one of said two elements of said ligand-receptor pair.

58. (previously presented) The process according to claim 42, further comprising detection, measurement, or a combination thereof of the complexes resulting from the reaction between said ligand and said receptor.

59. (previously presented) The process according to claim 42, wherein said ligand is an antigen or a hapten, and said receptor is an antibody or a membranous receptor targeted specifically against said ligand.

60. (previously presented) The process according to claim 59, wherein said reaction between said ligand and said receptor is revealed by agglutination.

61. (previously presented) A process for detecting the presence of a substance corresponding to at least one of said ligand or said receptor of a ligand-receptor pair in an analytical sample, comprising an

62. (original) A detection process according to claim 61, characterised in that it includes:

- the bringing into contact of two reagents containing respectively the ligand and the receptor, in conditions suitable to allow their reaction,
- previously, simultaneously or subsequently to this bringing into contact, the application, to one and/or the other of these reagents, of an electromagnetic signal obtained from an electrical signal produced by a sensor placed in front of the analytical sample; said electromagnetic signal being hereinafter designated the electromagnetic signal characteristic of the biological activity of the analytical sample, and
- the detection and/or the measurement of the ligand-receptor complexes formed during the reaction between the two reagents.

63. (original) A detection process according to claim 62, characterised in that the concentrations of the ligand and of the receptor are chosen so as to be sufficient to lead to the obtaining of ligand-receptor complexes detectable in the absence of the application of said electromagnetic signal characteristic of the biological activity of the analytical sample, but lower than the concentrations likely to lead to a saturation of the reaction between this ligand and this receptor.

64. (original) A detection process according to claim 61, characterised in that it includes:

- the bringing into contact of the analytical sample with a reagent containing either the receptor, if the substance sought in the sample is the ligand, or the ligand, if the substance sought in the sample is the receptor, in conditions suitable to allow their reaction,
- previously, simultaneously or subsequently to this bringing into contact, the application, to this sample and/or this reagent, of the electromagnetic signal characteristic of the biological activity of one and/or the other of the two elements of the ligand-receptor pair, and
- the detection and/or the measurement of the ligand-receptor complexes possibly formed.

65. (withdrawn) A device for detecting the presence of a substance corresponding to

- a) reception means (47) of the analytical sample and of a reagent containing either the receptor, or the ligand, allowing them to be brought into contact in conditions suitable to allow their reaction;

- b) a source (5, 9, 9', 19) of the electromagnetic signal characteristic of the biological activity of one and/or the other of the two elements of the ligand-receptor pair;

- c) application means (51) to the sample and/or to the reagent of the electromagnetic signal characteristic of the biological activity of one and/or the other of the two elements of the ligand-receptor pair delivered by said source (5, 9, 9', 19); and

- d) detection and/or measurement means (53, 55, 57) of the ligand-receptor complexes formed during the reaction between the sample and the reagent.

66. (withdrawn) A device for detecting the presence of a substance corresponding to one of the two elements of a ligand-receptor pair in an analytical sample, characterised in that it implements a process according to claim 61, and in that it comprises:

- a) reception means (47) of the analytical sample and of a reagent containing respectively the ligand and the receptor, allowing them to be brought into contact in conditions suitable to allow their reaction;

- b) acquisition means of an electromagnetic signal obtained from an electrical signal produced by a sensor placed in front of the analytical sample; said electromagnetic signal being hereinafter designated the electromagnetic signal characteristic of the biological activity of the analytical sample, and

- c) application means (51) to one and/or the other of the reagents of said electromagnetic signal characteristic of the biological activity of the analytical sample, and

- d) detection and/or measurement means (53, 55, 57) of the ligand-receptor complexes formed during the reaction between the two reagents.

67. (withdrawn) A device according to claim 65, characterised in that the detection means comprise optical detection means.